Doc. 28819/1-2.8.2.1/2.4.1/6.5

U.S. Department of Transportation

United States Coast Guard

Commandant
U.S. Coast Guard

2100 Second Street, S.W.
Washington, DC 20593-0001
Staff Symbol: G-TTH-2
Phone: (202) 267 1359

FOR AGENDA

Ref. Doc. 28745/2-2.8.2.1/2.4.1
2400
24 MAY 1994

RECEIVED
JUN 2 1995
FEDERAL COMMUNICATIONS COMMISSION

EX PARTE OR LATE FILED

MEMORANDUM TO CHAIRMAN, INTERDEPARTMENTAL RADIO ADVISORY COMMITTEE

From: U.S. Coast Guard IRAC Representative

Subject: RESPONSE TO THE FCC NOTICE OF INQUIRY (NOI) CONCERNING THE USE OF FREQUENCIES ABOVE 30 GHz; IVHS USER SERVICE REQUIREMENTS

This memorandum submitted on behalf of the Federal Highway Administration.

Continued expansion of our Nation's highway system is no longer an adequate option for reducing traffic congestion. The United States Department of Transportation (U.S. DOT) has established, within the Federal Highway Administration (FHWA), the Intelligent Vehicle Highway System (IVHS) program to use advance computer, control and communications technology to increase throughput on existing roadways, improve safety, reduce pollution associated with highway use and improve productivity of commercial vehicle operations.

Many of the IVHS user services in the category of Advanced vehicle Safety Systems (AVSS) depend on the use of radar technology for their implementation. Subsequently, these user services will require spectrum in frequency bands above 30 GHz. Examples of the user services requiring the use of radar technology are longitudinal collision avoidance, lateral collision avoidance, intersection collision avoidance, pre-crash restraint deployment and automated vehicle operation. Longitudinal collision avoidance will help prevent head-on and rear-end collisions between vehicles as well as other objects or pedestrians. Similarly, lateral collision avoidance will help prevent collisions when vehicles leave their lane of travel. Intersection collision avoidance and pre-crash restraint deployment rely on the ability of vehicle radar to detect velocity, mass and direction of vehicles and objects involved in a potential crash to ward the driver, and if necessary, respond by invoking safety features such as tightening lap shoulder belts and deploying air bags. Automated vehicle operation will incorporate radar as part of adaptive cruise control systems to improve safety and increase throughput of existing highways.

There are several engineering issues involved in the design of obstacle warning radar for vehicles and forward-looking sensors for adaptive cruise control that would affect the choice of frequency for implementation. For example, the antenna aperture for longitudinal collision avoidance must confine the illumination area to the width of a lane to avoid false alarms

No. of Copies rec'd 1
List A B C D E

from objects such as overhead bridges and signs. The antenna must also be compact for proper vehicle mounting. Since antenna dimensions are inversely proportional to beam width and directly proportional to wavelength, implementations of different user services requiring different illumination areas may be optimized in different frequency bands. Also, the use of different band segments will alleviate electromagnetic compatibility and radio frequency interference problems that could arise from a wide proliferation of these devices.

Collision avoidance radar development for use in Europe is occurring primarily in the 76-77 GHz band, which is currently authorized for these systems. For frequencies above 30 GHz, development in the United States is proceeding in the 76-77 and 37-38 GHz bands for collision avoidance and obstacle detection radar, as well as development of adaptive cruise controls in the 60 GHz band. It is highly likely that spectrum in all three of these frequency ranges will be required for development and implementation of IVHS user services. As manufacturers develop, refine and improve their products, other portions of the spectrum above 30 GHz may prove to be well-suited. As the technology matures, additional spectrum needs will be noted.

J. HERSEY
USCG (DOT) IRAC Representative